ON SOME AETHIOPIAN *ARCTIIDAE* (LEPID.).

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(With 11 text-figures.)

THERE are in tropical Africa a number of species of Arctiids which recall by their black-dotted white wings the European *Spilosoma lubricipeda* L. 1758. They are distributed in Hampson, *Lep. Phal.* iii (1901) and *Suppl.* ii. (1920), among the genera *Diacrisia* (in 1920 replaced by *Spilosoma*, which is younger than *Diacrisia*), *Estigmene* and *Amsacta*. The authors of the species have generally relied on some differences in the number of spots. A cursory examination of a series of specimens proved (1) that the maculation is very variable within the species, and (2) that specimens agreeing in colour and pattern may be quite different in the ♂-genitalia and therefore belong to different species. As none of the authors who described and named the various "species" have compared the tail-ends, a re-examination of the species-types is a necessity. It is the object of the present paper to supply a future monographer of the Arctiids with descriptions and sketches of the genitalia of some of the types to which I have had access. No revision of the genera in question is intended, nor have I seen all the described black-dotted white African species of *Diacrisia* (s. lat., Hampson). Besides the types in the Tring Museum and some in the British Museum, I have examined some of Bartel's types which Professor M. Hering very kindly sent me.

I. SPILOSOMA (Hampson, *l.c.* iii, p. 256, as *Diacrisia*).

Foretibia without apical claw; hindtibia with two pairs of spurs.——The apex of the foretibia is not truncate, but subdorsally somewhat emarginate, there being a short projection dorsally and another laterally corresponding to the "claws" of *Estigmene*, *Amsacta* and *Hyphantria*. The presence or absence of the proximal pair of spurs on the hindtibia is not really of generic value in this case, as is proved by *Spilosoma affinis* Rothsch. 1910. Hampson had already noticed in *Amsacta* that this distinction did not hold good in some species.

In the species here dealt with the eighth tergite of the ♂ (VIII. t.) has either a more or less distinct median tooth or a sharp tooth on each side at some distance from the middle; the eighth sternite is medianly depressed and the median portion of the apical margin is curved upwards, the angles of this turned-up lobe often being tooth-like. The anal tergite (X. t.) is sharply pointed, the apical portion, viewed from above, being pyriform; the median line is raised, and the tip slightly curved down. The pleural clasping organs consist of a pair of long valves, one valve each side, of which the apical portion is divided into two broad lobes, more or less spatulate, the apical lobe being marked P^1 in our figures and the subapical lobe P^2; P^1 is always simple, at the most faintly emarginate at the apex, whereas P^2 is divided into two lobes in two of the species, being in one of these divided in the left valve and not divided in the right; in most cases P^2 is more strongly curved inward-dorsad than P^1; both lobes are individually variable in length, width and curvature, the two valves showing frequently

marked differences from each other. The ninth sternite (IX. st.) in between the bases of the valves is swollen and usually subglobular. The penis-sheath (Pen) bears teeth on the outer surface in some species and not in others, while the membranous reversible inside has numerous teeth in all the species. The penis-funnel (P-F) differs more or less in the various species.

The genitalia of the ♀♀ have not yet been studied extensively; the seventh

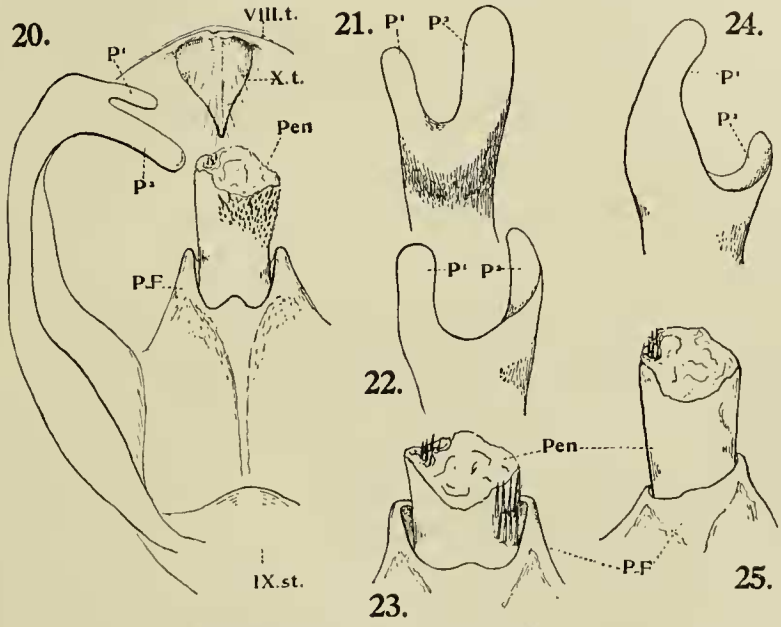

Fig. 20.—*Sp. assimilis assimilis*, ♂-genitalia, ventral aspect.
„ 21.—*Sp. assimilis assimilis*, end of clasper, lateral aspect.
„ 22.—*Sp. assimilis indeterminate*, end of clasper, lateral aspect.
„ 23.—*Sp. assimilis indeterminate*, penis-funnel and penis-sheath, ventral aspect.
„ 24.—*Sp. assimilis rattrayi*, end of clasper, lateral aspect.
„ 25.—*Sp. assimilis rattrayi*, penis-funnel, and penis-sheath.

sternite is swollen in all species and apically somewhat incised in middle. It will be necessary to compare the spermathecae before one can be sure to which ♂♂ some of the ♀♀ belong.

1. Spilosoma assimilis Hübn. 1822.

Phalaena Bombyx maculosa Stoll, *Pap. Exot.* iv. p. 156, tab. 370, fig. B. (1781) (S. Leone), nec *Ph. Bombyx maculosa* Gerning (ex W. Verz.) 1780.
Ecpantheria assimilis Hübner, Verz. p. 183 (1822).
Diacrisia maculosa, Hampson, *Lep. Phal.* ii. p. 276 (1901) (partim).

The specific name *maculosa* Stoll cannot be used for this species on account of the earlier *maculosa* Gerning. Hübner noticed that the name given by Stoll was preoccupied and therefore renamed the species *assimilis*.

In all the forms here united as subspecies of *S. assimilis* the spots of the forewing have pale centres, as a rule all or nearly all, sometimes only a few. Most specimens have the anterior angles of the frons or a larger portion of the frons blackish or brown, rarely is the frons entirely white (cf. first subspecies).

VIII. t. with small median tooth (text-fig. 20) ; the two processes P^1 and P^2 of the valve simple. IX. st. less strongly swollen than in the species following.

From West Africa to Arabia, not in South Africa, in a number of subspecies.

a. S. assimilis assimilis Hübn. 1822.

Ph. B. maculosa Stoll, *l.c.* ; *E. assimilis* Hübn., *l.c.* ; *Alpenus aequalis* Walker (1855).

Frons sometimes quite white. The two processes P^1 and P^2 (text-fig. 20) spatulate, curved inward, the sinus between them narrow (text-fig. 21). Penis-sheath (Pen) with a patch of short teeth on the right side. Penis-funnel (P-F) conical at each side of the sheath, rather strongly chitinised ; ventral median projection of funnel distinct.

Senegambia and Sierra Leone.

The difference between this insect and the next is very evident in all our ♂♂. As we have from Sierra Leone also a specimen of the next subspecies, there would be some justification in regarding *assimilis* as a distinct species.

b. S. assimilis indeterminata Walk. 1855.

Ecpantheria indeterminata Walker, *List Lep. Ins. B.M.* iii. p. 697. no. 15 (1855) (Ashanti).
? *Halesidota* ? *macularia* id., *l.c.* xxxi. p. 314 (1864) (New York !).
Spilosoma eyralpenus Plötz, *Ent. Zeit. Stettin*, xli. p. 83 (1880) (Camerun).
Spilosoma rattrayi, Hampson, *l.c. Suppl.* ii. p. 373, pl. 58, fig. 16 (1920) (partim).

Frons always with some black colouring, at least at the anterior corners. The two processes of the clasper always wider apart than in *D. a. assimilis*, each variable in length, the lower process P^2 usually strongly curved inward-upward, mostly with a raised line across its outer surface as continuation of the edge of the sinus between the two processes (text-fig. 22, dorso-apical aspect), the sinus sometimes larger than in our figure, and P^2 often shorter. Penis-sheath (Pen) usually with a patch of long spines on the right side resembling the spines of the inside ; raised sides of penis-funnel (P-F) not conical as in *D. a. assimilis*, but broad, forming a collar which somewhat extends on to the dorsal side of the sheath.

Sierra Leone (1 ♂), southward to Angola and the Upper Congo.

c. S. assimilis rattrayi Rothsch. 1910.

Diacrisia rattrayi Rothschild, *Nov. Zool.* xvii. p. 129 (1910) (Entebbe).
Spilosoma rattrayi, Hampson, *l.c. Suppl.* ii. p. 373 (1920) (partim, nec fig.).

Frons sometimes without black corners. Median tooth of VIII. t. longer than in the previous race, lower lobe P^2 of clasper shorter (text-fig. 24), strongly curved upward (not always so short as in the figure), penis-sheath without patch of spines on outside, and penis-funnel asymmetrical (text-fig. 25).——♀ more or less tinted with yellow.

Uganda.

d. S. assimilis pardalina Rothsch. 1910.

Diacrisia pardalina Rothschild, *l.c.* p. 128, pl. 14, fig. 14, ♀ (1910) (partim ; Ukerewe).
Spilosoma pardalina, Hampson, *l.c. Suppl.* ii. p. 374 (1920) (Ukerewe, type ♀).

Frons more extended blackish than in *D. a. rattrayi*, ♀ darker buffish.

♂-genitalia as in *S. a. rattrayi*.

Ukerewe, Kavirondo and Tanganyika Territory.

c. S. assimilis schraderi Rothsch. 1910.

Diacrisia schraderi Rothschild, *l.c.* p. 128, pl. 14, fig. 29 (1910) (Erythraea).
Spilosoma diversata Hampson, *l.c. Suppl.* ii. p. 372, pl. 58, fig 15, ♀ (1920) (Somaliland).
Spilosoma schraderi, Hampson, *l.c. Suppl.* ii. p. 374 (1920) (type ♀).

Like *S. a. rattrayi*, but the spots at the base of the forewing rather smaller. Hardly distinguishable without the help of the locality label. ♂-genitalia without reliable distinction from those of *S. a. rattrayi*.

Erythraea and Somaliland.

f. S. assimilis yemenensis Hamps. 1920.

Spilosoma yemenensis Hampson, *l.c. Suppl.* ii. p. 374, pl. 58, fig. 17, ♂ (Yemen).

The spots of the forewing enlarged, more or less confluent, occupying more space than the white ground. ♂-genitalia not examined very closely.

Yemen.

2. Spilosoma oligosticta Hamps. 1920.

Estigmene jacksoni Rothschild, *l.c.* p. 164 (1910) (Uganda), nec *Spilosoma jacksoni* Rothschild, *ibid.* p. 140 (1910).
Spilosoma oligosticta Hampson, *l.c. Suppl.* ii. p. 368, pl. 48, fig. 14 (1920) (Uganda ; n. nov.).

The type-specimen is much worn, therefore semihyaline. The average specimen agrees with the figure of *S. investigatorum* in Hampson, *l.c. Suppl.* ii. pl. 18, fig. 18 (1920). I cannot find any colour difference between *S. oligosticta* and *S. investigatorum*. In both species the frons is always entirely white, and the spots of the forewing have no pale centres. ♂-genitalia very different from those of *S. assimilis* ; VIII. t. (text-fig. 26) with a sharp tooth each side ; the right and left claspers different, the lower process P^2 of the right clasper simple, shorter than P^1 ; in the left clasper P^2 divided into two lobes and the apical process P^1 shorter than that of the right clasper. This asymmetry noticeable also in the penis-funnel, the collar around the penis-sheath being somewhat higher on the right side than on the left. Penis-sheath (Pen) on the left side with a smooth apical hump which bears a short, stout, subconical tooth, visible as a rule in between the two lobes of P^2 of the left clasper in the specimens with the claspers in a normal rest-position (our figures are drawn from specimens in which the claspers have been artificially pressed sidewards).——Swollen VII. st. of ♀ smaller than in *S. assimilis*, less broad transversely.

Wings varying in ♂ and ♀ from being almost without spots to being densely spotted.

Gold Coast, Benue R., French and Belgian Congo, Angola, eastwards to the Lado Enclave and Kenya ; evidently common in East Africa.

Here belong possibly also *S. microsticta* and *S. tristicta* Hamps. 1920, which I have not examined. *Emminaria migropunctata* B. Baker (1908) may also belong here, in which case that specific name would have priority.

3. Spilosoma investigatorum Karsch 1898.

Spilosoma investigatorum Karsch, in Werther. *Hochl. Deutschostafrika*, p. 313 (1893) (Bagamoyo) ; Hamps., *l.c. Suppl.* ii. p. 375, pl. 58, fig. 18 (1920) (partim).
Spilosoma cribraria Bartel, *Iris*, xvi. p. 176 (1903) (Mhondo, ♂).
Spilosoma mhondana id., *l.c.* p. 179 (1903) (Mhondo, ♀).

The types of the three names mentioned in the synonymy have been compared by me ; *S. cribraria* is a ♂ with the genitalia as in *S. investiga-*

torum; *S. mhondana* is a ♀ obtained at the same place by the same collector as *S. cribraria* and is according to the VII. st. a specimen of this species.

As in *S. oligosticta*, the frons without black; tergite VIII as in that species with two teeth, of variable length. Anal tergite (X. t.) broader. Apex of clasper more strongly curved, the right and left claspers practically alike, in both claspers process P^2 forked (text-fig. 27). Penis-sheath without the large hump of *S. oligosticta*. Penis-funnel forming a lower collar.——Swelling of VII. st. of ♀ broader than in *S. oligosticta*.

Uganda, Kenya, Tanganyika Territory and Nyasaland.

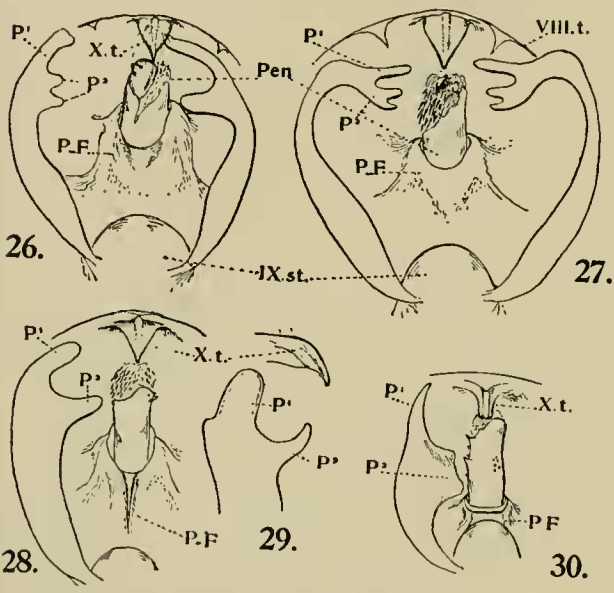

FIG. 26.—*Sp. oligosticta*, ♂-genitalia, ventral aspect.
,, 27.—*Sp. investigatorum*, the same.
,, 28.—*Sp. diffinis*, the same.
,, 29.—*Sp. diffinis*, end of X.t. and of clasper, lateral aspect.
,, 30.—*Est. purus*, ♂-genitalia, ventral aspect.

4. Spilosoma diffinis n. nov.

Diacrisia affinis Rothschild, *l.c.* p. 172 (1910) (Lokoja, Niger). nec *Spilosoma affinis* Bartel 1903.

Hindtibia with one pair of spurs, as in *Creatonotus* (Hampson, *l.c.* iii. p. 331), but in one of the 15 specimens before me (9 ♂♂, 6 ♀♀) the subapical pair is represented by one spur on the left hindleg and by two on the right one. In spite of the usual absence of these spurs, the species is closely related to the other *Spilosoma* here dealt with. Tergite VIII of the ♂ resembles that of *S. assimilis* in being medianly produced into a tooth, which is obtuse, the margin of the segment usually being slightly incurved at each side of the projection. Anal tergite less widened subapically than in the three previous species, but with a very distinct median ridge. Right and left claspers alike, with two simple processes, the upper one very broad, with the dorsal margin abruptly widened, there being a distinct projection (text-fig. 29), which is absent from the other species. On the right side of the penis-sheath a few apical teeth. Penis-funnel with median ventral ridge.—— VII. st. of ♀ with a swelling which is somewhat wider transversely than longitudinally.

Spots of wings small, not very numerous in any of our specimens (fewer than 40 dots on the forewing), sometimes only a few dots present; hindwing without subanal spot or this very small.

Senegambia (8 ♂♂, 5 ♀♀), Lokoja (1 ♂, type), White Nile (1 ♀).

II. ESTIGMENE Hübn. 1822.

The genotype *E. acrea* Drury 1773 selected by Hampson is very different from the African species of which I figure here the genitalia; but both have the foretibia armed with a pair of apical claws, of which the dorsal (or inner) one is fairly prominent. Hindtibia with two pairs of spurs. The ♂-genitalia differ considerably from those of the preceding species of *Spilosoma*.

1. Estigmene purus Butl. 1878.

Alpenus purus Butler, *Proc. Zool. Soc. Lond.* 1878, p. 382 (Abyssinia).
Estigmene pura, Hampson, *l.c.* iii. p. 343, pl. 47, fig. 3, ♀ (1901) (Brit. E. A.).
Spilosoma edlingeri Bartel, *Iris*, xvi. p. 180 (1903) (Benue R.).
Diacrisia albescens Rothschild, *l.c.* p. 122 (1910) (Ogruga, Niger).
Amsacta evadne Fawcett, *Proc. Zool. Soc. Lond.* 1915, p. 93, pl. i. fig. 4, ♂ (Kedai, Brit. E. A.; type at Tring).
Estigmene evadne, Hampson, *l.c. Suppl.* ii. p. 437 (1920) (♀ "type" in B.M.).

The number of spots on the forewing varies from fewer than 5 to more than 50. The majority of specimens have one or more submarginal spots on the hindwing.

♂-genitalia: VIII. t. (text-fig. 30) without tooth. Anal tergite (X. t.) quite different from that of *Spilosoma assimilis* and allies in being truncate, and dorsally impressed in the middle, a distinct channel running to the apex. Clasper with two processes, the apical one, P^1, pointed, somewhat curved, subconical, the lower one very broad and short, placed about midway between base and apex, and its upper portion twisted dorsad, the lobe slightly emarginate and, at rest, closely appressed to the penis-sheath, the emargination of the lobe making a close approximation to the cylindrical sheath possible. Penis-sheath with a longitudinal row of teeth on the left side, of which 1 or 2 are largish, and a small patch of minute teeth on the right side. Penis-funnel short, its edge somewhat inerassate (marginate), forming a half-ring around the penis-sheath.——VII. st. of ♀ flat, with fairly sharp edge, which is broadly incurved and ends laterally in a short compressed lobe; VIII. st. with median transverse swelling, which is usually glossy.

Nigeria, Aïr, White Nile, Abyssinia, Kenya, Tanganyika Territory, Nyasaland, Portuguese E. Africa, S. Rhodesia, Angola.